

Report on the Falcon Lead Mining Company, Rico, Colorado, by Tom Lyon and Paul Billingsley, April, 1926, was made before the Nora Lilley winze was sunk, as shown on the map by Tom Lyon and Paul Billingsley, 600 feet from the portal of the Nora Lilley tunnel on a 60 foot crosscut to the south. Considerable work was done on the Nora Lilley tunnel itself after this report was written.

Elizabeth E. Pellet.

Dotted lines showing winze were superimposed on the map later.

(COPY)

Report on the
FALCON LEAD MINING COMPANY

Rico, Colorado

By

Tom Lyon, Paul Billingsley

April, 1926

INTRODUCTION

This report is made at the request of Mr. Erastus T. Tefft to determine the advisability of accepting a \$200,000 bond issue, and also to check, from a geological viewpoint, the report of Mr. Frederick Bradshaw made November 30, 1925.

CONCLUSIONS

The Falcon Lead Mining Company has developed ore to the extent of 30,200 tons.

The profits on the developed ore is estimated as follows, from actual costs obtained by the Falcon Company, which is now being operated entirely by hand. A compressor is now being installed which should materially reduce the costs, thereby increasing the profits.

Mine	Tons	Profit Per ton	Total Profit
Nora Lilley	8,500	\$7.00	\$59,500
Falcon	2,000	4.00	8,000
Yellow Jacket:			
Swede Ore Body	14,000	8.00	112,000
Beacher and Koenig ore bodies	3,500	5.00	17,500
Herron and other ore bodies	2,200	5.00	11,000
Total Falcon Company	30,200	Av. 6.88	\$208,000

The ore above enumerated is in no sense the ultimate amount that will be produced by the respective ore bodies, but merely that within the limits of the existing drifts and raises. The Swede ore body alone, for an example, may easily prove to contain twice the tonnage allotted to it.

The general prospects of the property are excellent, from a geological point of view, due to the number of veins known to exist, and the widespread occurrence of ore within them, and the size and persistence of the ore bodies already developed.

We consider that the resources of the property justify a bond issue up to \$200,000.

We have read Mr. Frederick Bradshaw's report on this property, dated November 30, 1925, and consider it to be a conservative report.

Respectfully submitted,

Tom Lyon

Paul Billingsley

ASSUMPTIONS

We assume that non-geological aspects of the property, such as legal status of titles, options, etc., have been investigated through other channels.

The indicated profit per ton is obtained by calculating the returns to the mine, under International Smelting Company contracts, from ore of an average grade determined from existing assay maps. It was not deemed necessary to re-sample the properties for the following reasons:

(a) Shipments to the International Smelting Company have been made on a large scale for several months. The grade of these has corroborated the assays, and gives an equally reliable average for the respective ore bodies.

(b) To thoroughly re-sample the mines would necessitate taking and assaying hundreds of samples, considerably increasing the expense of the examination.

(c) Since the values are almost entirely in the base metals -- lead, zinc, and copper, a very close estimate of the grade of a face of ore can be made by inspection, particularly since we are mining and assaying similar ore in the International Smelting Company's mines at Rico.

The profits are based on present metal prices, and the cost assumed provide ample margin for development work necessary to insure the future of the mine. It is assumed that operations will continue to be conducted with efficiency equal to that attained by the present management.

HISTORY OF THE DISTRICT

The Rico Mining District has passed through the first of the several cycles of exploration and mining, which usually accompany the development of western mining camps of its type. Like Park City and Leadville, it is a district in which ores occur as replacement deposits formed at the intersection of veins and sedimentary beds which are favorable to ore deposition. There are rich silver phases of mineralization in some areas, and zincy base phases in others.

The location of mining claims was made as early as 1877, and in 1880 a small smelter was built to treat the rich oxidized silver ores found high on Nigger Baby Hill. The productive mines on this hill were the Grandview, Hope and Cross, and Phoenix, which are now owned by the Falcon Lead Mining Company.

In 1886 rich silver ore was discovered on Newman Hill in what is known as the Therprise mine, and from this time on until 1895 the camp was active. During 1895 the peak was reached and the production started to decrease until 1900, when practically all the work was in the hands of leasers, who were merely cleaning up after the major operations. This ended the first cycle.

Since 1900 there have been sporadic attempts to mine and ship zinc ore running high in lead and silver. Although some 35,000 tons of this class of ore have been shipped, there has not been much profit, except possibly during the period of high zinc prices during the war.

During November, 1924, the International Smelting Company started to mill by selective flotation, the complex lead-zinc ores from the Park City district in Utah, and sent its scouts to Colorado to see if there was any available tonnage of similar ore in that territory.

The Falcon Lead Mining Company was then shipping a complex lead-zinc ore to the American Smelting and Refining Company's lead smelter at Durango. The rates offered by the International Smelting Company were so attractive that notwithstanding the high freight rate to its plant, it was able to obtain a contract with the Falcon Company for its ore. This stimulated development work in the district, both in the Falcon mines and others. By the fall of 1925 the International had started a prospecting campaign on some options acquired by it late in the summer. A few months later, the National Lead Company took over some property and started an intensive development campaign. The Rico Argentine, one of the older mines of the district, has resumed operations and is now shipping complex zinc ores. At present there are over 200 men on the pay rolls of the various operating companies.

The ore reserves in the Falcon mines and others have increased to a point where the International Smelting Company has authorized the erection of a mill to treat the ores. Thus the second cycle is well under way.

The above history is parallel to many of the great camps, notably the Park City district in Utah, where the ore occurrence is almost identical in many respects to the ore occurrence in Rico.

GENERAL GEOLOGY OF THE RICO DISTRICT

Geologically, the Rico district consists of an anticlinal dome with gentle dips in all directions. The canyon of the Dolores river traverses the dome from north to south, and its tributary Silver Creek, flowing in from the east, has cut a canyon and gives a section on that flank also. Where Silver Creek enters the Dolores river the town of Rico is situated.

The lowest formations, exposed on the crest of the anticline just north of the town of Rico, are pre-Cambrian schists and quartzites. Above these is the following sequence in ascending order.

Base-	Pre-Cambrian Schists	
	Pre-Cambrian quartzite	
	Cambrian Basal quartzite	100 ft.
	Devonian dolomite	200 ft.

Pennsylvanian

Lower Hermosa-sandstones and shales
with 300 ft. porphyry sill near the
base 750 ft.

Middle Hermosa-limestone beds alter-
nating with sandstone and shale 400 ft.

Upper Hermosa-sandstone and shale
with some thick limestone members 850 ft.

Rico - Red beds of shale and sandstone 300 ft.

The antilinal structure is accentuated by the fact that the crest coincides with a block of ground relatively up-thrown, bounded by east-west faults on the north side (Last Chance-Nelly Bly), and by the northeasterly Silver Creek fault system on the south side. It is within this block that the Devonian and lower formations reach the surface; north of the Last Chance, and south of the Silver Creek fault, are Hermosa beds.

The mineralization of the district is derived from a mass of intrusive monzonite, which outcrops in the above described "high" block, west of the Dolores River. A contact halo in the Devonian fringes this stock, and the ore occurrence indicates that from it vein solutions travelled outward to the northeast, east, and southeast. The course they followed was determined by an intricate vein system; intricate both in geographical distribution and in sequence of repeated mineralizations.

1. The earliest mineralization was near the contact, and consisted of garnet, chlorite, epidote, specularite, and magnetite.
2. Next in evidence is bedding replacement along fissures in the formation which coincide roughly with lines of slight folding. Such mineralization is heavy sulphides, sphalerite, chalcopyrite, a little galena and pyrite, and also contains specularite in areas near the monzonite.
3. Third is vein mineralization, occurring in tight fissure veins of northeast strike, which is approximately tangential to the monzonite contact. This type consists of banded quartz, sphalerite, galena, and rhodocrosite, with decreasing zinc and increasing silver away from the monzonite.
4. Cutting these northeast veins are northwest fault veins, containing very similar mineralization. They are roughly radial to the contact and are thus more sharply northwest in the southern part of the district than in the northern, where they are almost east-west.

Both the 1st and 4th type make bedding ore as well as the 2nd. Favorable horizons have been developed as follows:

Base of Devonian
Top of Devonian

Falcon Mine
Nora Lilley
Atlantic Cable
Shamrock

Lower Hermosa-
So-called "Newman Hill contact"
a bedding crushed zone about 700
ft. above base

Nora Lilley
Newman Hill Mines

Middle Hermosa-

Many of the thin limestone members

Phoenix mine
Yellow Jacket mine

Massive Limestone members

Rico Argentine

Upper Hermosa-

Thin limestone beds

Union Carbonate

Rico

Rico Wellington

The mines named in the above list cover the important mines of the district.

GEOLOGY OF THE AREA OWNED BY THE FALCON LEAD MINING CO.

The area owned by the Falcon Company may be divided geologically into three blocks, which are separated from each other by large east-west faults.

(a) The Falcon Block, which is bounded on the south by the Falcon ownership line, and on the north by the Last Chance fault.

(b) The Yellow Jacket block, which is bounded on the south by the Last Chance fault, and on the north by the Nelly Bly fault.

(c) The Grandview block, which is bounded on the south by the Nelly Bly fault, and on the north by the Falcon ownership line.

The names of the above mentioned blocks were taken from the names of the mines located within these boundaries.

The rocks exposed on the surface of the Falcon block consist of Pre-Cambrian quartzite, Cambrian quartzites, Devonian dolomites, and the black shales which lie at the base of the lower Hermosa. (Pennsylvanian) All these formations dip southerly. This block is traversed by one known vein system which is responsible for the ore body in the Falcon mine. This ore body occurs at the intersection of the veins with a favorable ore-making stratum which occurs near the base of the Devonian dolomite.

The rocks exposed in the Yellow Jacket block are Hermosa limestones, sandstones, and shales, dipping in general to the northeast. This block is traversed by three known vein systems. These have been responsible for ore bodies in at least three of the different limestone strata which are interbedded with the sandstones and shales of this area. There may be others which have not yet been developed.

The rocks exposed on the surface of the Grandview block are composed of the red sandstones and shales of the lower Rico formation, and the sandstone shales and limestones of the Upper Hermosa formation. The veins which made ore in the Grandview and Hope and Cross mines are present in this block. The upper portion of these veins were mined in the early eighties for oxidized silver-lead ore, but no deep development has been done, consequently the lower ore-making strata in this block are still to be developed.

A more detailed description of the various mines of the Falcon Lead Mining Company will now be taken up.

THE FALCON MINE

The Falcon workings are situated on the southwest flank of Nigger Baby Hill, almost one-half mile northeast of the town of Rico. The workings are within the area designated as Falcon Block and the principal rocks exposed on the surface are Devonian dolomites and quartzites, and Pre-Cambrian quartzites. This mine is developed by three tunnels - the uppermost of which is extremely old and is now caved and inaccessible.

The ore in this mine occurs at the intersection of a series of veins with a favorable stratum, lying at the top of the Devonian quartzite. The two important veins dip steeply to the south and have a northwest strike. The beds dip gently to the south and have a more nearly east-west strike so that the intersections of the veins with the ore bed form ore channels which rake downward to the southeast.

Considerable stoping has been done along the more southerly vein, and the core of the ore body, which was copper ore, was extracted, leaving the halo of copper-zinc-lead ore still in place. By extending the workings both to the east and west of the main tunnel, more ore will be developed. There is no reason why the ore body should not extend a considerable distance to the east, but it may come to the surface in two or three hundred feet to the west. The northern vein is developed by raises for a length of 150 feet, and shows zincky bedding ore along this distance. The two veins will easily make about 15 tons per foot of intersection with the favorable bedding, and while we have only given the Falcon mine 2,000 tons of ore it can easily be seen that for each additional 100 feet of development along this ore channel at least 1500 tons of ore will be developed. The prospects of developing a considerable tonnage of ore in this mine are good.

THE NORA LILLEY MINE

This mine is located on the western flank of Nigger Baby Hill, about one-half mile north of the town of Rico. The workings consist of three drifts. (See Plate 3)

The ore in this mine occurs in a vein which lies between two branches of the Last Chance fault. Stratigraphically the two upper tunnels are probably in the extreme lower Hermosa, or upper Devonian, and in a section in which no known ore-bearing strata occur. Better prospects in this respect are found both above and below these workings. The nutmeg tunnel, which is much lower on the hill, is on either the same or a parallel vein, and is entirely in the Devonian quartzite. By extending the tunnel farther into the Hill and raising, the same stratum in which the Falcon ore bodies occur would be encountered. The chances for ore at this point is good.

The Nora Lilley ore reserve is entirely within the vein, which contains in the upper tunnels an ore shoot from 3 to 4 feet wide and 250 feet long. It is developed by an upper and lower tunnel 50 feet apart. The ore shoot shows strong sulphide mineralization, and the ore will average from 15 to 25 per cent combined lead and zinc, with from 7 to 12 ounces of silver. There are about 8,500 tons of this class of ore developed. A second ore shoot occurs about 200 feet to the east. This ore shoot is narrow and lower grade. It should improve on a higher level where it will enter the more favorable stratum in which the first ore shoot was found.

Further development along the strike of this vein should prove productive, and, as above stated, there are good prospects between the Nutmeg tunnel and the upper workings.

THE PHOENIX-YELLOW JACKET MINE

Introduction

This is the principal property of the Falcon Company and is located on the south flank of Nigger Baby Hill about a mile east of the town of Rico. The workings are in what we have called the Yellow Jacket block. This block is north of the Last Chance fault, and is down-thrown relative to the Falcon block. On the surface it has lower Hermosa formation against the quartzite of the latter. The throw on the Last Chance fault is thus from 900 to 1000 feet. North of the present Yellow Jacket-Phoenix workings is the Nelly Bly fault which again drops the ground to the north, throwing the base of the Rico formation against the lower part of the middle Hermosa. This fault therefore must have a throw of at least 1000 feet. The block of ground between these two large faults contains the principal ore bodies of the Falcon Company and will now be discussed in detail.

The position of these ore bodies has been determined by three factors; (1) the occurrence of favorable members in the formation; (2) the structure of the formation, i.e. its dip and strike and local folding; and (3) the presence of several vein systems.

(1) Formations

The formations found in the Yellow Jacket fault block, from the surface to the lowest present workings, are entirely Hermosa. It is possible to construct, from the openings now made, a detailed stratigraphic column of about 350 feet in thickness. This is given on Plate 4. It can be seen from this that the formations consist predominately of sandstones, which become distinctly more thinly bedded toward the base, and more limy toward the top of the measured section. Other workings show that the predominance of limestone is still more marked higher up. It is possible therefore that this section of the formations lies just at the base of the middle or limestone member of the Hermosa, extending down into the lower member, Plate 4 shows also the position of the beds which have, at one place or another, been mineralized. The lowest, called 516 bed, is developed at only two points and has not yet produced much ore. About 70 feet above this is the Beacher bed, consisting of about 10 feet of limy shale with 3 feet of black shale at the base, lying on a footwall of massive sandstone. This Beacher bed has been the principal ore-bearing stratum of the mine. Next above is the Herron group of ore beds, of which the lowest, the Rat bed, is 100 feet above the Beacher and the highest, the Herron, 40 feet higher. The Herron bed has also been an important ore-bearing horizon. These beds occur in a limy, shaly sandstone member. 60 feet above the Herron is a true limestone, soft and rich in crinoid remains. In this is the Star ore bed. There are thus five principal ore beds, of which the highest, the Star, lies about 265 feet stratigraphically above the lowest, 516 Bed.

(2) Structure

These formations lie, in the Yellow Jacket fault block, in an anticlinal structure. Along the central part of the block is an irregular axis (of which more later), north of which the beds dip northerly and northeasterly, while south of it they dip southerly. The northern

limb is consistent in dip and strike throughout the workings from the uppermost, or No. 1 Phoenix level, to the lowest, or No. 5 level. The respective ore beds are found in this area, in their proper position, and very persistent ore shoots have been developed along their interseccions with the various vein systems. See Plate 5.

The zone of the axis of folding, however, is complex. It exhibits evidences of the following sequence of events (see also Cross Sections, Plate 6).

- a - Anticlinal folding-thus
(This was period of mineralization)
- b - Collapse of crest of anticline into local
synclinal trough - thus
- c - Overriding of south by north limb on
account of continued thrust from the
north - thus

- d - Downward slipping of south limb and folded zone on normal fault, thus-

This leaves the axis in its present form.

(3) Vein Systems

Five important vein systems have thus far been disclosed, all of strike nearly east-west, although slightly to the north of west. One vein parallels each of the bounding faults, the Nelly Bly to the north, and the Last Chance to the south, and three veins lie within the intervening block of ground. All important development has been confined to these latter.

From north to south, they are known as the Herron vein system, Beacher vein system, Beacher vein system, and Swede vein, respectively. The Herron and Beacher lie on the north flank of the above mentioned anticlinal fold, the Swede directly along the axis. Thus the former veins cut the ore beds in a simple northeast dipping position, while Swede vein has intersected and mineralized the more complex structure on the crest. This resulted in much greater extent of mineralization, while the post mineral events - (b, c, and d above) have broken and dragged out the ore body into the present fantastic form (see Sections, Plate 6).

Ore Reserves

The ore reserves of the Yellow Jacket mine are found along the above three vein systems, mostly within one or more of the favorable beds along the intersections of the veins. They thus lie in "ore-channels" which run, like the veins, in east-west or west-north-west directions, and which rake downward to the east on account of the geometry of the intersections.

The principal ore body now in sight lies along the Swede vein (see plates 5d and 5e).

Discovered only a few months ago, it has already been developed to a point where its tonnage of proved ore almost equals that of the other mines of the district combined. The development consists of a drift on the vein just below the crumpled ore bed. In this drift the vein is mostly quartz and pyrite. When it enters the ore bed, however, the mineralization changes at once to the typical heavy sulphide aggregate of sphalerite, galena, and pyrite. A thickness of about 20 feet of bedding is replaced adjacent to the vein, gradually diminishing to 4 feet at a distance of 15 or 20 feet away. This narrower bed of ore extends upward in "Y" shape on either side of the ore body beyond any limit as yet reached in the stopes or raises. Probably with sundry interruptions by faulting, it will extend to the Beacher Vein stopes on the north and to the surface on the south.

Meanwhile, the developed tonnage may be taken as that above the present drift, between the easternmost and westernmost raises, with a cross section as indicated in the raises and stopes. The latter gives a minimum of 40 tons per linear foot for the last 200 feet (between raises 7 and 12). The eastern end is smaller, for the overthrust has encroached upon the ore body; so 20 tons per foot will be fair for this section, 200 feet in length. The total developed is therefore 12,000 tons up to Raise 12. The drift, however, has followed the vein 100 feet farther west, so that a block of probable ore may be added over this distance - 4000 tons. There is no apparent reason why this ore body should not extend westward for 1000 feet or more.

The ore bed on the southern arm of the "Y" has been partially developed in the Woods Hole tunnel for a distance of about 200 feet. It will average 3 feet wide, and contains, down to a distance of 25 feet below the level, about 2000 tons of ore.

The stopes have been started on this Swede vein ore body, and about 35000 tons have been shipped to the International. There was no sorting, so the grade of these shipments is a fair representative of the ore body. They averaged as follows: 3.01 oz Ag; 11.65% Pb; 18.2% Zn; 0.212% Cu; about 20% Fe. The net return to the mine was \$16.25; the cost \$8.29 and the profit \$7.96 per ton.

It is more difficult to estimate the ore reserves on the Beacher and Herron veins. They consist in large part of pillars, and of zincky peripheral ore on the edges and in the backs of stopes.

The Beacher ore channel is developed from the 5th level for 750 feet to the westward, where it is followed by intermediate levels above the 4th. In the area between the 5th and 4th levels it is partially stoped; but 1500 tons of heavy sulphide ore, largely zinc, is left in the back of the Koenigs;

and probably as much more in pillars and on the edges. Above the 4th level is a block of ore between the south edge of the Beacher stope and the Swede incline, which contains 1500 tons. In the vicinity of the western intermediates the ore channel has divided into two smaller channels, the northern one of which is largely stoped out. The southern is untouched except where crossed by Incline Raise No. 1. About 500 tons is in sight in this area. All this Beacher ore will contain about 3 ounces silver 7 per cent lead and 15 per cent zinc.

The Herron vein has mineralized at least three thin limestone beds which occur in a group about 100 to 150 feet stratigraphically above the Beacher. The uppermost bed of the group has been largely stoped out from the 4th level westward and upward to the old Grandview workings above the Phoenix 1st level. However, in the stopes now accessible between the 4th and 2nd levels there remain about 1200 tons, which will be somewhat higher in all the metals than the Beacher ore. The lower bed has recently been opened up below the 3rd level; where it shows 2 or 3 feet of high grade lead-zinc ore. There is no reason to doubt that this bed will contain an ore channel along the Herron vein system comparable to that in the upper bed. Until it is further developed, however, we will allow only 100 tons for its reserve.

The total ore reserve in the Phoenix-Yellow Jacket mine is therefore as follows:

Swede ore body proper -	12,000 tons - plus 4000 probable less 3500 stoped
Woods Hole bed -	2,000 tons
Beacher bed - Koenig stope Beacher	
Stope	1,500 tons
West end	500 "
Herron vein - Herron Bed	1,200 "
Lower bed	1,000 "
T o t a l	19,700 tons

It must be emphasized again that this is by no means the final content of completely developed ore bodies. It is, on the contrary, merely a portion now visible in workings, of ore bodies which may ultimately yield many times the above tonnage.

Prospecting Possibilities

The first and obvious possibility of course is to develop the proved ore channels farther along their long axes. Thus the Swede ore body can doubtless be followed for a long

distance to the west. Similarly the Beacher ore shoot can be followed to the east and west. The Herron bed already has been followed to the surface at both ends.

Recommendations for these prospects may be written as follows: (See Geologic Plan Maps)

1. Extend west drift from Swede Incline to west as far as Swede vein can be followed. Raise at Intervals to ore bed. (See Plate 5c)

2. Extend No. 6 level crosscut on present course until Beacher vein is cut (see projection on Geologic Map of No. 6 level). Drift east on vein and raise to ore bed. (See plate 5h)

3. Either - follow westward on existing workings on Beacher ore shoot; or drift west on Beacher vein from Woods Hole north cross-cut. (See Plate 5c and 5b)

The second type of prospecting consists in testing intersections of known veins with other favorable ore beds. Thus the Beacher vein, which makes ore in the Beacher ore bed, may also make ore in 516 Bed below and in the Rat and Herron beds above. Caution must be exercised in every case to ascertain that the upper beds have not been removed by erosion. (See Cross Sections, Plate 6) The following intersections do remain, and should be prospected.

1. Swede vein and 516 ore bed - on 5th level and above to west. (See Plate 5g)

2. Beacher vein and 516 ore bed - will be accessible from 6th level. (See Plate 5h)

3. Herron vein and Rate ore bed - developed just below 3rd level - may extend west to Grand view and east to 4th level and below. (See Plate 5c)

4. Herron vein and Beacher ore bed - best tested by winze from 5th level in Beacher bed, starting near commencement of long northwest drift. (See Plate 5g)

5. Herron vein and 516 ore bed - can ultimately be reached from the 6th level.

A third type of prospecting will be the exploration of the two undeveloped veins - Nelly Bly and Last Chance, at their intersection with the above favorable horizons, and in the former case, with the Star bed above (See Plate 5f)

The fourth development will consist of exploration of lower formations beneath the above known productive veins. The Devonian Limestone, for example, which lies below the Hermosa formations, is extremely productive elsewhere in Rico, (Atlantic Cable and Shamrock mines) and is also the principal ore horizon in the Leadville, Red Cliff and Curay districts. As near as can be estimated the Swede vein will enter the Devonian at an elevation of about 9000 feet. The Nora Lilley tunnel, elevation 9043, will reach the intersection in 800 feet. (See Plate 1)

Finally, the Rico and underlying formations north of Nelly Bly fault were productive in the old Grandview mine, and should have other possibilities yet undeveloped. In this area is a wide zone of northwest veins corresponding to the extension of the Herron vein system, and also the east-west Nelly Bly vein. All these will enter the limestone beds of the Middle Hermosa at elevations corresponding to the lower Phoenix levels.

SUMMARY

The properties of the Falcon Lead Mining Company thus combine the following desirable features:

a. An adequate reserve of developed ore, as follows:

	Tons	Mining Profit	
		Per Ton	Total
I - Nora Lilley	8,500	\$7.00	\$59,500
II - Falcon	2,000	4.00	8,000
III - Yellow Jacket:			
Swede ore body plus Woods	14,000	8.00	112,000
Hole			
Beacher-Koenig	3,500	5.00	17,500
Herron-Rat	2,200	5.00	11,000
T o t a l	30,200		\$208,000

b. Numerous prospects in which there are good chances of developing more ore along proved "channels", such as Swede, Beacher, Herron.

c. Numerous prospects of finding new ore-channels in undeveloped intersections both within the area exploited at present and also on outlying veins and in overlying and underlying formations.

The chances of success in both of the above categories are so good that if development along these lines is conducted at an adequate rate there is very little reason to fear the exhaustion of the properties for some years to come.